Investigating the relationship between intellectual capital and the financial, economic and stock market performance of the firms accepted in the stock exchange of Tehran

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Abstract  
From the standpoint of resource-based theory, intellectual capital is considered as a strategic source. In fact, the theory asserts that firms can manage to achieve high levels of competitive advantage and financial competence through effective achievement, maintenance and use of strategic resources. Based on this theory, intellectual capital, as a strategic source, allows firm to create added value. Thus, considering the role of intellectual capital in the creation of value, and based on the value-added intellectual coefficient method, the concept of added value has been used in this research as an indicator for the measurement of intellectual capital. Moreover, the research has tried to investigate the relationship between intellectual capital and firms' financial, economic and stock market performance. Using Multiple Regression model, the research was performed on the firms accepted in the stock exchange of Iran during the years between 2005 and 2009. Using firms' data, it was specified that there is a significant and positive relationship between value-added intellectual coefficient and firms' financial, economic and stock market performance. This result indicates that intellectual capital has an important role to reduce costs and to generate value for shareholders and other beneficiary groups, and those shareholders consider intellectual capital as a value-creating source.  

Keywords: Intellectual Capital, Added Value, Value of Stock Market, Firm's Performance.  

1. Introduction  
Innovation and value-generation are now specifically taken into account by managers, investors, economic institutions and the government. Most firms are at the moment investing in a variety of areas including staff-training, research and development, customer-relations, bureaucratic and computer systems, etc. Such investments, which are now referred to as intellectual capital, have
currently been developing, and even in some countries have gone beyond financial and physical investments. Such a change in the structure investment has now led to the appearance of knowledge-based new economy according to which, intellectual capital is considered as the main source for the development of value in the new economy (Ze’ghal and Maaloul, 2010). The traditional accounting models used to focus only on financial and physical assets but ignored those assets related to intellectual capital. Poverty to recognize intellectual capital accounting and the role of such accounting in the creation of value has caused that the financial statements which are based on such models not to show many of the values for shareholders and other users of such information (Ashton, 2005).

The aim of the research is to find a relationship between intellectual capital and firm's performance. Based on the research, such a relationship, if exists, can present a guideline necessary for the firms that are willing to be completely aware of their performance to use the knowledge-based economy and intellectual capital for the generation of value. Accordingly, the questions that can be put forward in this research are as follows: is there any relationship between intellectual capital and firm's financial performance? Is there any relationship between intellectual capital and firm's economic performance? Is there any relationship between intellectual capital and firm's stock market performance?

Based on the value-added intellectual coefficient, the concept of added value is used in this research as an indicator to measure intellectual capital and to investigate the relationship between intellectual capital and financial, economic and stock exchange performance of firm.

2. Intellectual Capital

During the late 1990s researchers and experts in management tried to classify and define the components of intellectual capital. Edvinsson and Malone (1997) and Stewart (1997), in their studies, classified intellectual capital into two components including: 'human capital' and 'structural capital'. Human capital, according to them, is defined as the knowledge, expertise, and skill of the staff working in a specific firm. Structural capital also consists of production processes, information technology, customer relations, research and development, etc. There is still another classification, in addition to this one, which divides structural capital into organizational wealth and customer capital (Guthrie et al., 2004; Sveiby, 1997).

Based on resource based theory, intellectual capital is taken into account as a strategic source. In fact, the theory states that firms will manage to achieve high levels of competitive advantage and financial efficiency through effective achievement, maintenance, and use of strategic source (Peteraf, 1993). Thus, as a strategic source, intellectual capital allows firm to create added value (Riahi-Belkaoui, 2003).

3. Value-Added Intellectual Coefficient

According to Pulic (2004), intellectual capital cannot by itself create value, and it is necessary that firm's physical capital be taken into account by its resources so that to examine the created added value. Thus, based on the role of intellectual capital in the creation of value, Pulic (1998) has developed a new method, called value-added intellectual coefficient, for the measurement of firms' intellectual capital. This new method is important because it measures the share of each source (human, structural and physical) in the creation of added value for firm.

Based on Pulic's method, value-added intellectual coefficient (VAIC) was used in the present research for the measurement of firms' intellectual capital. It has various stages to measure value-added intellectual coefficient. The first stage is to calculate firm's power for the creation of added value. Based on beneficiary's theory, added value can be calculated by adding payment costs and interest costs to the profit before tax (Riahi-Belkaoui, 2003).

The second stage is to evaluate the relationship between value-added (VA) and human capital (HC). Value added human capital coefficient (VAHU) shows how much added value has been created on a particular employee by an invested financial unit. According to Pulic (2004), employee costs are considered as an index of human capital. Therefore, the relationship between added value and human capital is indicative of the ability of human capital for the creation of value in firm.

VAHU = VA / HC

The third stage is to find the relationship between value added and structural capital (SC). Value added structural capital coefficient (STVA) indicates the share of structural capital in the creation of value. The relationship between structural capital and value added is represented as follows:
The fourth stage is to calculate the value added intellectual capital coefficient (VAIN) which represents the share of intellectual capital in the creation of value. As intellectual capital consists of human capital and structural capital, value added intellectual capital coefficient is calculated as follows:

\[ \text{VAIN} = \frac{\text{STAV}}{\text{VAHU}} \]

The fifth stage is to calculate the relationship between value added and financial and physical capital. Based on Pulic (2004), intellectual capital cannot create value on its own, hence being necessary to consider financial and physical capital as well. The value added capital employed coefficient (VACA) shows how much new value is created by the monetary unit resulting from the financial and physical capital. This relationship is represented as follows:

\[ \text{VACA} = \frac{\text{VA}}{\text{CA}} \]

Accordingly, using both kinds of capital including physical and intellectual, value added intellectual coefficient is calculated as follows:

\[ \text{VAIC} = \text{VACA} + \text{VAIN} \]

4. The Research Background
Edvinsson and Malone (1997) have defined intellectual capital as a type of knowledge that can be changed into value. In their studies, these researchers classified intellectual capital into human capital and structural capital (Edvinsson and Malone, 1997). According to Ashton (2005), this classification of intellectual capital has been one of the most important classifications to date. Using the data from Austrian firms, Pulic (1998) concluded that intellectual capital is positively related to value added. However, the correlation between the employed capital (i.e. financial and physical) and value added is low.

Riahi-Belkaoui (2003) did some research on American multinational firms. The results are indicative of the existence of positive relationship between intellectual capital and future performance of firm. He stated that intellectual capital is a strategic source which is capable of creating value for firm.

Chen et al (2005) also in a study which was done on the firms in Taiwan concluded that intellectual capital and employed capital have positive effects on future and current financial performance.

Tan et al (2007) in his research investigated the relationship between intellectual capital and financial returns of companies. The results indicated that in the first instance there is a significantly positive relationship between intellectual capital and the current and future financial returns of firms, and secondly the effect of intellectual capital on the financial returns of firms is different in various industries.

The results of the study done by Ze’ghal and Maaloul (2010) are indicative of the existence a significant and positive relationship between the financial and economic performance of firms and their intellectual capital.

Anvari rostami and Seraji (2005) in their study tested five methods for the assessment of intellectual capital. The results of the statistical tests performed in this study indicated that the fourth and the fifth methods had a significant and strong correlation with the market value of the firms' shares; moreover, considering the high determination coefficient of these two methods, they were shown to have a better explanatory ability than the first three methods.

Madhushi and Asghar nejad Amiri (2008) in their study tried to investigate the relationship between the value of intellectual capital and the financial returns of active investing firms in the stock exchange of Tehran. The findings are suggestive of significant and positive relationships between intellectual capital and financial returns; intellectual capital and future financial returns; and the growth rate of intellectual capital and the growth rate of future financial returns of the firms that are actively investing in the stock exchange of Tehran.

5. Research Methodology
With respect to data collection method, the present research is a descriptive study and regarding the aim it is an applied one.

It is believed by a great many of researchers that doing investment in intellectual capital will lead to the improvement of firms' economic and financial and stock exchange performance (Bismuth and Tojo, 2008; Casta et al., 2005). Therefore, using value added intellectual coefficient, the
present study wants to examine the economic and financial and stock exchange performance of firms.

To do so three models were defined as follows:

Model (1): \( OI/S = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu \)

Model (2): \( \text{ROA} = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu \)

Model (3): \( \text{MB} = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu \)

Where \( OI/S \) is the ratio of operational profit to the total sale as an index of economic performance, \( \text{ROA} \) is the ratio of profit before interest and tax divided by the book-value of whole assets as an index of financial performance, and \( \text{MB} \) is the ratio of stock market's value to the book-value of net assets as an index of stock market's performance. The two control variables of 'firm size' (Size) and 'leverage' (Lev) are also used to control their effect on the performance of firm. In fact, leverage (Lev) is sum of debits to the whole assets, and firm size is taken into account as the natural logarithm of sum of firm's assets (Riahi-Belkaoui (2003)).

5.1 Economic performance model

It is assumed by a great many of researchers that doing investment in intellectual capital allows firm to enhance its economic performance (Bismuth and Tojo, 2008; Casta et al., 2005). Economic performance is defined by operational profit which is indicative of economic surplus resulting from the difference between income and production costs (Cappelletti and Khouatra, 2004). Having invested in intellectual capital, firms will observe decrease in their production costs or increase of any operational profit margin, providing that such an investment is successful (Nakamura, 2001).

Gu and Lev (2003) in their model pointed out that firm's economic performance results from three various resources including physical, financial, and intellectual resources. They also maintained that the performance of firm is dependent not only on the capital invested in the physical, financial, and intellectual resources, but also on the ability of such resources for the creation of value added. Thus, using the value added intellectual coefficient, the two following hypotheses are put forward:

\( H1a: \) There is a significant and positive relationship between the value-added intellectual coefficient and firm's economic performance.

\( H1b: \) There is a significant and positive relationship between the value-added capitals employed coefficient and firm's economic performance.

To test this hypothesis, model (1) was used:

Model (1): \( OI/S = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu \)

5.2 Financial performance model

Some researchers in their studies decided that intellectual capital has a positive effect on firm's financial performance (Peteraf, 1993; Tan et al., 2007). Financial performance is defined by profitability which is the ability of employed capital for the acquisition of profit. Based on this viewpoint, the firms that focus more on intellectual capital are more competitive and successful than other firms with less attention to intellectual capital (Youndt et al., 2004).

Riahi-Belkaoui (2003) asserts that intellectual capital is used as efficiently and effectively as financial and physical capital. This efficiency, to him, is evaluated on the basis of the ability of resources for the creation of value added for firm. Therefore, using the value added intellectual coefficient, the two following hypotheses are put forward:

\( H2a: \) There is a significant and positive relationship between the value-added intellectual coefficient and firm's financial performance.

\( H2b: \) There is a significant and positive relationship between the value-added capitals employed coefficient and firm's financial performance.

To test this hypothesis, model (2) was used:

Model (2): \( \text{ROA} = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu \)

5.3 Firm's stock exchange performance model

The deep gap existing between firm's book value and its market value can be due to ignoring intellectual capital in financial statements (Skinner, 2008). In fact, the gap is shown in the ratio of market value to book value and suggests that investors disregard intellectual capital as a source of
value for firm. In an efficient market firms with higher intellectual capital are more appreciated and valued by investors. Thus, using the value added intellectual coefficient, two more hypotheses are put forward as follows:

**H3a:** There is a significant and positive relationship between the value-added intellectual coefficient and firm's stock exchange performance.

**H3b:** There is a significant and positive relationship between the value-added capitals employed coefficient and firm's stock exchange performance.

To test this hypothesis, model (3) was used:

\[
\text{Model (3): } MB = \beta_0 + \beta_1 \text{ VAIN} + \beta_2 \text{ VACA} + \beta_3 \text{ Size} + \beta_4 \text{ Lev} + \mu
\]

Using Multiple Regression model, the research was performed on the firms accepted in the stock exchange of Iran during the years between 1384 and 1387. The techniques which were used in this research included multiple regression, significant difference regression test (F-ratio), distinct regression coefficient (t-test), and multiple determinative coefficient. The data gathered were analyzed using SPSS software.

The statistical population used for the research was the firms which were accepted in the stock exchange of Tehran. To select sample from this population some conditions were made (i.e. for firms to be accepted as the research sample, they should have some qualifications), including:

1. The firms should have been accepted in the stock exchange before 2005.
2. The firms should not be among investing firms or should not be the ones with some specific activity (such as finance firms).
3. The firms whose fiscal year ends on Esfand 29 (Eve’s day) every year.
4. The firms that have not changed their fiscal year during the research period.
5. The firms that have not experienced transaction stops for longer than three successive months during the period of analysis.
6. The firms' data should be accessible.

As can be observed, the researcher has not done a true sampling in this study, but using elimination method, he has selected the samples from the research population. In other words, all the firms with the above qualifications were chosen to work as the sample and were analyzed. Eventually, 81 firms were chosen as the research sample.

### 6. Analysis

To make sure no correlation problem exists among the independent variables, Pearson correlation coefficient was calculated between the explanatory variables. This coefficient is illustrated in table 1.

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAIN</td>
<td>0.01</td>
<td>0.24</td>
<td>0.09</td>
<td>0.00</td>
</tr>
<tr>
<td>VACA</td>
<td>0.33</td>
<td>0.36</td>
<td>0.34</td>
<td>0.31</td>
</tr>
<tr>
<td>Size</td>
<td>-0.11</td>
<td>-0.25</td>
<td>-0.26</td>
<td>-0.19</td>
</tr>
</tbody>
</table>

Kennedy (1985) states that the correlation between independent variables changes into a serious problem if the correlation between descriptive variables is more than 0.8. As can be observed, the correlation coefficient between the variables is not so high; thus, it can be assumed that no correlation problem exists between the independent variables.

Table 2 illustrates the minimum, maximum and mean of the research variables. As observed in this table, the mean of the variable MB is more than 1, which indicates that investors value firms more than the book value of their net assets existing in financial statements. For example, the mean of the variable MB in the year 2005 was 3.16. This indicates that 70% of firms' market value is not reflected in their financial statements.
### Table 2. Descriptive statistics of the research variables

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>OI</td>
<td>0.02 0.04 0.04 0.02</td>
<td>1.04 0.04 0.64 0.79</td>
<td>0.27 0.28 0.27 0.26</td>
<td>0.17 0.16 0.15 0.17</td>
</tr>
<tr>
<td>ROA</td>
<td>0.06 0.06 0.06 0.04</td>
<td>0.46 0.04 0.00 0.48</td>
<td>0.22 0.24 0.22 0.20</td>
<td>0.10 0.12 0.11 0.10</td>
</tr>
<tr>
<td>MB</td>
<td>0.12 0.66 0.66 0.23</td>
<td>12.0 0.23 6.43 0.19</td>
<td>3.16 2.65 2.14 1.65</td>
<td>2.37 1.78 1.35 0.99</td>
</tr>
<tr>
<td>VAIN</td>
<td>1.64 1.60 1.60 1.39</td>
<td>29.3 1.39 13.6 10.61</td>
<td>5.45 4.87 4.31 4.01</td>
<td>5.05 3.19 2.20 1.79</td>
</tr>
<tr>
<td>VACA</td>
<td>0.10 0.13 0.13 0.11</td>
<td>0.66 0.11 0.80 0.60</td>
<td>0.33 0.35 0.33 0.32</td>
<td>0.12 0.14 0.13 0.12</td>
</tr>
<tr>
<td>Lev</td>
<td>0.31 0.22 0.22 0.34</td>
<td>0.90 0.34 0.87 0.92</td>
<td>0.66 0.57 0.57 0.59</td>
<td>0.15 0.15 0.14 0.13</td>
</tr>
</tbody>
</table>

Comparing the value of the variables VACA and VAIN in table 2 shows that the analyzed firms have created more added value form intellectual capital than from financial and physical capital. These findings are consistent with the findings of Pulic’s research (2004).

### 6.1 Analyzing the Economic Performance Model

Model (1) and the hypotheses H1a and H1b are analyzed separately for each of the analysis years:

Model (1): $$\text{OI}/S = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu$$

Considering the above table, the amount of p-value for the variable VAIN during the years 2006, 2007 and 2008 was smaller than 0.05. Thus, H1a is accepted. Therefore, it can be concluded that there is a significant and positive relationship between value-added intellectual coefficient and firm's economic performance during the years 2005, 2006, and 2007 at the significance level of 0.05 ($\alpha=0.05$).

H1b is also accepted for the years 2005 and 2007. In fact, considering the amount of p-value for the variable VACA which is smaller than 0.05, H1b is accepted. Therefore, it is concluded that there is a significant and positive relationship between the value-added capital employed coefficient and firm’s economic performance during the above mentioned years at the significance level of 0.05 ($\alpha=0.05$).

### Table 3. The results acquired from model (1) for the years 2005 until 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>coefficient</th>
<th>Fixed coefficient</th>
<th>VAIN</th>
<th>VACA</th>
<th>size</th>
<th>Lev</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>-0.24</td>
<td>0.00</td>
<td>0.44</td>
<td>0.03</td>
<td>-0.7</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.31</td>
<td>0.94</td>
<td>0.03</td>
<td>0.03</td>
<td>0.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0.24</td>
<td>0.03</td>
<td>0.04</td>
<td>0.00</td>
<td>-0.26</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.17</td>
<td>0.00</td>
<td>0.72</td>
<td>0.91</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>0.35</td>
<td>0.02</td>
<td>-0.06</td>
<td>0.01</td>
<td>-0.40</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.09</td>
<td>0.00</td>
<td>0.67</td>
<td>0.69</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>-0.03</td>
<td>0.05</td>
<td>0.44</td>
<td>0.00</td>
<td>-0.21</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.90</td>
<td>0.00</td>
<td>0.01</td>
<td>0.78</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 4. The results acquired from model (2) for the years 2005 until 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>coefficient</th>
<th>Fixed coefficient</th>
<th>VAIN</th>
<th>VACA</th>
<th>size</th>
<th>Lev</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>-0.24</td>
<td>0.01</td>
<td>0.78</td>
<td>0.01</td>
<td>0.02</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>-0.20</td>
<td>0.01</td>
<td>0.77</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>-0.16</td>
<td>0.02</td>
<td>0.72</td>
<td>0.00</td>
<td>0.02</td>
<td>0.93</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.29</td>
<td>0.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>-0.12</td>
<td>0.03</td>
<td>0.67</td>
<td>0.00</td>
<td>-0.01</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.03</td>
<td>0.00</td>
<td>0.00</td>
<td>0.84</td>
<td>0.87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6.2 Analyzing the Financial Performance Model

Using model (2), H2a and H2b was tested for each of the years under analysis.

Model (2): $$\text{ROA} = \beta_0 + \beta_1 \text{VAIN} + \beta_2 \text{VACA} + \beta_3 \text{Size} + \beta_4 \text{Lev} + \mu$$

With respect to table 4, H2a is accepted for all the analysis years. In fact, because the amount of P-value for the variable VAIN is smaller than 0.05, H2a is accepted. Therefore, the conclusion is that there is a significant and positive relationship between value-added intellectual coefficient and firm's financial performance at the significance level of 0.05 ($\alpha=0.05$).
H2b is also accepted for all the years analyzed. As a matter of fact, concerning the amount of P-value for the variable VACA, which is smaller than 0.05, H2b is accepted. Thus, the conclusion is that there is a positive and significant relationship between the value-added capital employed coefficient and firm's financial performance at the significance level of 0.05 ($\alpha = 0.05$).

### 6.3 Analyzing the Firm's stock market performance

Here model (3) was used for each of the years under analysis:

Model (3): $MB = \beta_0 + \beta_1 VAIN + \beta_2 VACA + \beta_3 Size + \beta_4 Lev + \mu$

Based on the information presented in table 5, H3a is approved for all the years under analysis. In fact, concerning the amount of p-value for the variable VAIN which is smaller than 0.05, this hypothesis is accepted. Thus, the conclusion is that there is a positive and significant relationship between value-added intellectual coefficient and firm's stock exchange performance.

With respect to the p-value of the variable VACA which is smaller than 0.05, H3b is also accepted for all the analysis years. Therefore, it is concluded that there is a significant and positive relationship between value-added capitals employed coefficient and firm's stock exchange performance.

### Table 5. the results acquired from analyzing model (3) for the years 2005 until 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>explanation</th>
<th>Fixed coefficient</th>
<th>VAIN</th>
<th>VACA</th>
<th>size</th>
<th>Lev</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>coefficient</td>
<td>-7.94</td>
<td>0.13</td>
<td>9.15</td>
<td>0.15</td>
<td>8.29</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.41</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>coefficient</td>
<td>2.21</td>
<td>0.23</td>
<td>3.65</td>
<td>-0.27</td>
<td>2.74</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.35</td>
<td>0.00</td>
<td>0.03</td>
<td>0.09</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>coefficient</td>
<td>-1.81</td>
<td>0.27</td>
<td>5.48</td>
<td>-0.07</td>
<td>3.26</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.32</td>
<td>0.00</td>
<td>0.56</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>coefficient</td>
<td>-0.16</td>
<td>0.31</td>
<td>3.36</td>
<td>-0.18</td>
<td>3.30</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>p-value</td>
<td>0.91</td>
<td>0.00</td>
<td>0.04</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
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</table>

### 7. Conclusion

The traditional accounting model used to focus on financial and physical assets, but ignored most of the assets which were related to intellectual capital. Poverty to recognize intellectual capital accounting and the role of such accounting in the creation of value has caused that the financial statements which are based on such models not to show many of the values for shareholders and other users of such information. The traditional accounting model can so incompletely and limitedly measure the intellectual capital. Value can be created by unobserved assets that are not always reflected in financial statements. Intellectual capital is taken into account as an unobserved asset which encompasses technology, customer information, brand name, fame and organizational culture, which are so valuable for firms' competitive power (Low and Kalafut, 2002). Thus the attempt in the present research was to examine the relationship between intellectual capital and firm's performance.

Using value added intellectual coefficient, the present research tried to evaluate the effect of intellectual capital on the performance of firm. Hence, the attempt of the research was to test the following relations:

There is a positive relationship between value added intellectual coefficient and firm's economic, financial and stock market performance.

There is a positive relationship between value added capital employed (financial and physical) coefficient and firm's economic, financial and stock market performance.

The results of the statistical test showed that intellectual capital has a significant and positive relationship with economic performance. Based on this result, it can be concluded that intellectual capital has an important role in the reduction of production costs. This finding is consistent with that of Ze'gal and Maaloul (2010) who maintained that intellectual capital has a positive effect on firm's economic performance.

Doing analysis on firm's financial performance verified that intellectual capital has a positive and significant relationship with its financial performance. Thus, it can be concluded that intellectual capital plays the main role in the creation of value for stockholders. This finding is consistent with the findings of Tan et al (2007), and Ze'gal and Maaloul (2010) who all found a significantly positive relationship between intellectual capital and financial performance.
Moreover, the results of the statistical test indicated that intellectual capital has a significant and positive relationship with firm's stock exchange performance. This finding is consistent with that of Ze’ghal and Maaloul (2010) who also found a significant and positive relationship between intellectual capital and firm's stock exchange performance.

Therefore, using the firms' data, it was specified that there are significant and positive relationships between value-added intellectual coefficient and economic, financial and stock exchange value of firms. This finding indicates that intellectual capital plays the central role in the reduction of costs, and in the creation of value for stockholders and other beneficiary groups and that stockholders consider this kind of capital (i.e. intellectual capital) as a source for the creation of value.

The research findings also showed a significant and positive relationship between employed capital coefficient and firms' financial and stock exchange performance. This finding is indicative of the fact that employed capital (financial and physical) is so important for stockholders because of its significant role in the creation of value.

8. Recommendation

The results of the present study can be suitable for the following groups of users:
Managers are recommended to apply VAIC method so to be able to have a better management on intellectual capital.
Accountants can use VAIC method as a potential measurement criterion for reporting intellectual capital.
Investors can use VAIC method to help them select their portfolio firms.
Government can use VAIC method to evaluate various firms and also various economic parts based on value added intellectual capital and hence to make better economic policies and to improve the conditions of the new economy.
It is also suggested that more research be performed with more control variables so that more straightforward results are acquired.

References


